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Non-GAAP Earnings and Executive Compensation: An Experiment

Running Title: Non-GAAP Earnings & Exec Compensation

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Non-GAAP Earnings and Executive Compensation: An Experiment

Abstract: Prior literature suggests investors react to the *presence, presentation, and prominence* of non-GAAP earnings disclosures. We extend this literature by considering the *purpose* of non-GAAP earnings disclosures and their effect on investors' judgments and decisions. Employing an experiment, we manipulate the role non-GAAP earnings plays in determining executive compensation. We find when non-GAAP earnings are used to determine executive compensation, investors assign a higher evaluation of corporate financial performance and invest significantly more capital. Consistent with attribution theory, our mediation model finds that the use of non-GAAP earnings to remunerate executives strengthens the informative *perception* of non-GAAP earnings disclosures, which in turn influences their evaluation and investment decision. Investors' judgments are consistent in both the GAAP loss and GAAP profit scenarios. Contrary to prior literature, we find investors intentionally rely on non-GAAP earnings in their decision making. These findings support the regulation of non-financial information complementing non-GAAP financial measures.

Keywords: non-GAAP earnings, executive compensation, experiment, attribution theory

JEL classifications: M41, C91

Data availability: contact the authors

INTRODUCTION

This study examines whether the use of non-GAAP earnings to determine executive compensation (hereafter ‘non-GAAP compensation’) influences investors’ investment-related judgments and decisions. Wesley Bricker, the Chief Accountant at the Securities and Exchange Commission (SEC) noted there can be a ‘mischievous quality to non-GAAP reporting’ (Cohn, 2018). Prior research finds managers’ motivations for disclosing non-GAAP measures is varied and nuanced, but investors react more strongly to non-GAAP, relative to GAAP, earnings measures (Ribeiro et al., 2019). Management are motivated to both inform investors of the ‘true’ or ‘underlying’ corporate performance (Bradshaw and Sloan, 2002; Curtis et al., 2014; Choi and Young, 2015) and to mislead investors (Kolev et al., 2008; Black and Christensen, 2009; Isidro and Marques, 2015). The two motivations, respectively described as *informative* and *opportunistic*, are not necessarily mutually exclusive. Previous experimental and archival studies have shown the presence, presentation and prominence of non-GAAP disclosures affect investor judgments (Bradshaw and Sloan, 2002; Frederickson and Miller, 2004; Elliott, 2006; Allee et al., 2007; Christensen et al., 2014; Hogan et al., 2017). We extend this body of literature to consider if the *purpose* of companies’ use non-GAAP earnings affects investors’ judgments.

Current business practice is to base executive at-risk compensation on non-GAAP earnings (Sherman and Young, 2018). Guest et al. (2021) finding that high non-GAAP earnings predict abnormally high executive compensation suggests that using non-GAAP earnings for compensation contracting may lead to non-GAAP disclosures being overly opportunistic. However, a working paper by Black et al. (2020) finds, in an archival setting, investors rate non-GAAP earnings disclosures as more credible when the board uses the same measure for compensation contracting, suggesting how firms use non-GAAP earnings is informative for market participants. This paper seeks to contribute to the *opportunistic* versus *informative* debate by employing the experimental method to capture investors’ judgments when non-

GAAP earnings are used to determine executive compensation. We thus provide causal evidence on the relationship and explore the mechanism in detail to understand whether these types of disclosures of internal use are perceived as informative, and thus consequently impact the decisions of investors. We provide more detailed evidence on the *perception* of such disclosures, as compared to previous archival research, which has merely assumed that such *perceptions* exist.

Drawing on attribution theory (Heider, 1958; Barton and Mercer, 2005; Koonce and Mercer, 2005; Chen et al., 2016), we posit investment-related judgments and decisions are influenced by investors' perception of managements' disclosure motivation. The theory predicts two possible attributions investors can make regarding managements' disclosure of non-GAAP earnings when they exceed GAAP earnings. Investors could attribute an opportunistic motivation to managements' non-GAAP disclosure, believing the inflated earnings represent an attempt to mislead market participants. Alternatively, investors could attribute an informative motivation, believing management's higher non-GAAP earnings provides market-relevant information of the company's true underlying performance. A company's accompanying disclosure of the use of non-GAAP earnings to remunerate executives could strengthen the opportunistic attribution, as investors are now aware management uses the higher earnings figure in executive compensation calculations. That is, investors might believe managers are opportunistically managing their earnings-linked compensation. Alternatively, non-GAAP compensation disclosure could strengthen the informative motivation.

The informative role of non-GAAP earnings aligns with recent archival research that suggests investors rely on non-GAAP earnings more when used for management's compensation (Bansal et al., 2013; Black et al., 2020). However, the underlying mechanism is unclear, as is how investors might judge a non-GAAP profit when simultaneously reported with

a GAAP loss. Archival evidence shows that the use of non-GAAP reporting to turn a GAAP loss into a non-GAAP profit (loss converters) is common and is typically considered indicative of opportunistic behaviour (Walker and Louvari, 2003; Bhattacharya et al., 2004). Investors' attributions in the potentially more opportunistic earnings-sign-reversal setting is as yet untested. Such a setting provides a stronger test environment to untangle the attributions of investors. We explore the potential for opportunistic versus informative attributions by examining the effect a GAAP loss and simultaneous non-GAAP profit has on investors' judgments.

We use a 2 x 2 between-subjects experiment where participants view an extract of the 10-K filing of a hypothetical pharmaceutical company and record their judgments. The experiment manipulates the use of non-GAAP compensation (used/not used). After reading the 10-K extract, participants provide an evaluation of the company's financial performance and a quantitative assessment of its investment desirability. This manipulation allows us to determine if the use of non-GAAP compensation influences investors' judgments. The second manipulation is the level of GAAP earnings (GAAP profit/GAAP loss).¹ In every treatment, non-GAAP earnings are positive. The purpose of the second manipulation is to determine if the first manipulation effect holds in an earnings-sign-reversal scenario (GAAP loss with a simultaneous non-GAAP profit) which research suggests is more likely to be indicative of opportunistic behaviour by management.

Consistent with expectations, we find that the use of non-GAAP measures to determine executive compensation affects participants' judgments. Specifically, participants rate the financial performance higher, and are more willing to invest in a company that uses non-GAAP earnings as a basis for executive compensation. These findings persist when a GAAP loss contemporaneously accompanies a non-GAAP profit. Furthermore, we use mediation analysis

¹ In this study, 'GAAP earnings' and 'GAAP net income' are synonymous.

to understand the attributions of participants. The results support the notion that investors attribute non-GAAP earnings disclosures to management's desire to inform investors, rather than to opportunistically mislead them, and that this perception of informativeness drives the evaluation of financial performance and ultimately the investment decision.

We also find that investors intentionally rely on non-GAAP measures in their decision making, providing further support for the informative nature of non-GAAP disclosures. This contrasts with prior research that attributes unintentional cognitive effects as the mechanism influencing investors' judgments (Frederickson and Miller, 2004; Elliott, 2006). Two factors explain why we find investors relying on the non-GAAP measures. Firstly, significant public exposure (Henry et al., 2017) means investors are more aware of non-GAAP reporting. Secondly, SEC regulations (SEC, 2017a) have improved the quality of non-GAAP disclosures (Bond et al., 2017) and this has potentially impacted the perceived legitimacy of the non-GAAP earnings.

Specifically, for non-GAAP measures to be including in the SEC filings the SEC regulations govern: (1) the prominence of non-GAAP measures, (2) the reconciliation to appropriate GAAP measures, (3) requires justification for disclosing non-GAAP measures, and (4) details on management's use of non-GAAP measures (SEC, 2017b). Research finds that prominent and reconciling information does influence investor judgments (Elliott, 2006; Allee et al., 2007; Zhang and Zheng, 2011; Aubert and Grudnitski, 2014; Hogan et al., 2017). However, there is limited research of the SEC requirements for management to justify and discuss the use of non-GAAP measures. The current study focusses on managements' use of non-GAAP earnings for compensation. The extant research suggests that while non-GAAP earnings can opportunistically inflate compensation (Guest et al., 2021), investors rate non-GAAP earnings as more credible (Black et al., 2018). These conflicting results raise the question as to whether non-GAAP earnings are informative or opportunistic. Our findings that

investors' judgements are positively impacted by management's compensation use of non-GAAP earnings support the SEC's requirement to mandate corporate disclosure of the internal use of the non-GAAP measures as this information is informative.

The findings are also relevant to the standard setters; the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) are closely watching the evolution of non-GAAP reporting (Kabureck, 2017). Non-GAAP reporting, as the name suggests, is outside of the established accounting standards. To remain relevant in a reporting environment where voluntary disclosures appear to dominate the output from the accounting standards, the FASB and IASB are developing standards that add value to financial reports without overburdening corporate reporting requirements. Furthermore, the IASB has recently released an exposure draft on the general presentation and disclosures in financial statements; this exposure draft specifically highlights the importance of non-GAAP measures, referred to as management performance measures (MPM) by the IASB (2019). This study provides preliminary evidence for regulating the disclosure of managements' use of non-GAAP measures as investors find the disclosures informative. Interestingly, the disclosure of managements' use of MPM is not considered by the latest IASB exposure draft (IASB, 2019), yet the results of this study suggest that investors find it useful and rely on such disclosures in their decision-making and resource allocations.

The remainder of this paper is organised as follows. We first provide background on non-GAAP reporting, followed by the hypotheses development. We then outline the experimental design, and report our result. A summary of the study and conclusion is contained in the final section.

BACKGROUND

Non-GAAP disclosures in the United States (U.S.) rose to prominence in the mid-1990s. The practice quickly drew the attention of the financial press (Weil, 2001), industry bodies (James and Michello, 2003) and the regulator (SEC, 2001). Academic research initially focused on managements' motivations for disclosing non-GAAP measures. The two competing, but not mutually exclusive, hypotheses of managers' motivations are to provide information to the market (informative) or to mislead the market (opportunistic). Empirical studies have found support for both these perspectives, meaning that it is difficult to draw any conclusion regarding the dominance of either of these hypothesised motivations.

The potential opportunistic nature of non-GAAP earnings prompted the SEC to issue cautionary advice to the market (SEC, 2001). Congress also intervened and enacted the Sarbanes-Oxley Act (SOX) in 2002, partially to address non-GAAP disclosures. Recent evidence suggests that the SEC regulations are broadly successful in curbing opportunistic corporate reporting behaviour (Heflin and Hsu, 2008; Kolev et al., 2008; Black et al., 2012; Black et al., 2017a; Bond et al., 2017).

However, despite the success of the SEC regulations, there is still evidence of opportunistic non-GAAP disclosures (Barth et al., 2012; Curtis et al., 2014; Black et al., 2017a; Black et al., 2017b; Thielemann and Dinh, 2019). The SEC has also issued subsequent non-GAAP related Compliance and Disclosure Interpretations (C&DI) in 2010 and 2016. Bond et al. (2017) found the 2010 SEC C&DI partially reversed the positive effects of earlier regulation. Taken together, the SEC is still striving for non-GAAP regulatory balance.

The enactment of SOX resulted in regulations governing the public disclosure of non-GAAP measures (Regulation G)² and public company filings with the SEC (Regulation S-K)³.

² Code of Federal Regulations, 17 C.F.R. § 244 - Regulation G (2017)

³ Code of Federal Regulations, 17 C.F.R. § 229.10 (Item 10) General (e) (1) (i) Use of non-GAAP financial measures in Commission filings (2017)

Specifically, Regulation S-K, subpart 229.10 (e) mandates four requirements of companies disclosing non-GAAP measures in their filings. Registrants must present non-GAAP measures with equal or lesser prominence than their GAAP counterparts, reconcile non-GAAP measures to the most directly comparable GAAP measure, state why management believes the non-GAAP measure provides useful information to investors and disclose any internal, material use of the non-GAAP measure. Prominence and reconciliation have been extensively studied in archival and experimental settings (Frederickson and Miller, 2004; Elliott, 2006; Allee et al., 2007; Hogan et al., 2017). However, the final two requirements, managements' justification and use of non-GAAP measures, have as yet received little research attention. This paper adds to the limited research and examines the relationship between investor decision making and managements' use of non-GAAP measures. Furthermore, by using a mediation analysis, we also comment on the mechanism, that we posit is the informativeness attribution. Prior research has assumed that investors' perception is impacted by disclosures of internal use, while we effectively test this relationship.

Regulation S-K directs SEC filers to detail managements' use of non-GAAP measures. An inspection of the first quarter, 2018 10-Q filings reveals a variety of disclosed uses. For example, Procter & Gamble Company (2018) (PG) state their non-GAAP measures are *'used by management in making operating decisions, allocating financial resources and for business strategy purposes. These measures are also used to evaluate senior management and are a factor in determining their at-risk compensation'*. The first sentence in PG's explanation concerns using non-GAAP measures to manage the business. The second sentence in the PG example highlights another use of non-GAAP earnings, determining executive compensation, which is the focus of this paper.

HYPOTHESIS DEVELOPMENT

An extensive, largely archival, literature links executive compensation to corporate financial performance as a mechanism to reduce agency costs by aligning management and shareholder interests (Jensen and Meckling, 1976; Bebchuk and Fried, 2003). Using non-GAAP measures to determine executive compensation can undermine the agency contract because a conflict of interest can arise if management defines their own performance measures, albeit within the bounds agreed and monitored by the remuneration committee as part of the firm's corporate governance.

The non-GAAP literature documents agency issues and opportunistic management behaviour concerning executive compensation (Frankel et al., 2011; Bansal et al., 2013; Grey et al., 2013; Isidro and Marques, 2013). In a working paper, Guest et al. (2021) find firms with the highest-paid CEOs have the largest, positive differences between non-GAAP and GAAP earnings. They conclude that non-GAAP earnings reported to the market (investors) leads boards to more generously compensate executives, thereby giving management the incentive to inflate reported non-GAAP earnings opportunistically. That is, management uses non-GAAP earnings to influence the board, not the shareholders.

In support of using non-GAAP earnings to determine executive compensation, studies show non-GAAP earnings are more closely related to future earnings and stock returns (Bradshaw and Sloan, 2002; Bhattacharya et al., 2003; Marques, 2006; Choi et al., 2007; Collins et al., 2009). GAAP earnings contain items outside of managements' control known as 'noise' (Guay et al., 1996). The informative hypothesis suggests non-GAAP earnings can create a better measure of managers' actions by removing the 'noise'. Curtis et al. (2021) find that consistent with agency theory, corporate boards are more likely to use non-GAAP earnings in determining CEO compensation when GAAP earnings are less informative (i.e., 'noisy' or less responsive to management effort). If non-GAAP earnings are more closely linked to future financial

performance, it is reasonable that management is rewarded for their creation of shareholder wealth.

The findings of Guest et al. (2021) are premised on management dictating the definition of non-GAAP earnings to the board. Black et al. (2020) test this premise and find the board and management jointly determine non-GAAP earnings. They also find the boards' use of non-GAAP measures in determining executive compensation is a signal to investors of a higher quality non-GAAP disclosure and attribute this to investors' finding the disclosures more credible. In addition, earlier research supports the notion that linking compensation to non-GAAP earnings improves disclosure quality (Bansal et al., 2013). However, while this archival research provides some evidence on the use of non-GAAP earnings for compensation and the disclosure capital market impact, they do not address the perception of such disclosures. This is where our paper provides a contribution, with strong evidence on the perception of such disclosures, and whether these perceptions influence the decisions of investors.

Building on this non-GAAP agency-based research, we employ attribution theory (Heider, 1958) to examine the impact on investors' judgment and decision-making behaviour of using non-GAAP compensation. Non-GAAP compensation is hypothesized to affect two distinct dimensions of investor judgement, (1) evaluation of financial performance and (2) quantitative investment decisions.

Attribution theory suggests that how investors perceive managements' disclosures will impact the persuasiveness and interpretation of those disclosures (Barton and Mercer, 2005; Chen et al., 2016). Investors can assign one of two attributions to managements' disclosure of non-GAAP earnings accompanied by lower GAAP earnings. Management is perceived as either attempting to mislead investors or to inform investors. These attributions are consistent with opportunistic and informative hypotheses of managements' non-GAAP disclosure motivations. The additional non-GAAP compensation disclosure may strengthen the

opportunistic attribution, as it has been revealed management is remunerated based on the higher earnings figure. On the other hand, the additional non-GAAP compensation disclosure may strengthen the informative attribution, because the potential for the disclosure to be interpreted opportunistically may ultimately be costly to management. Therefore, management will only make a potentially costly disclosure if they believe non-GAAP earnings are more informative than its GAAP counterpart. Thus, the use of the non-GAAP earnings by the board signals that the measure is credible increasing the informativeness weight placed by users.

Drawing upon attribution theory, we hypothesise investors' judgments will be influenced by their perception of managements' motivation to disclose non-GAAP compensation. Consistent with the more recent research of non-GAAP earnings, that indicates that it is of higher quality when compared to GAAP earnings (Black and Christensen, 2018), and prior research showing a positive relationship between non-GAAP earnings quality and executive compensation (Bansal et al., 2013; Black et al., 2020), we predict investors will attribute the use of non-GAAP compensation to an informative motivation. Therefore, our first hypothesis is:

H1: Investors' evaluations of corporate financial performance will be higher (lower) when non-GAAP earnings are (not) used to determine executive compensation.

Previous non-GAAP research documents that non-GAAP disclosures affect investors' quantitative financial judgments. In experimental settings, non-GAAP disclosures affect investors' forecasted earnings per share estimates (Elliott, 2006; Andersson and Hellman, 2007), forecasted stock price valuations (Frederickson and Miller, 2004; Reimsbach, 2014) and the amount investors are willing to invest (Dilla et al., 2013; Hogan et al., 2017). The effects

are observed among both less sophisticated (Frederickson and Miller, 2004; Elliott, 2006; Dilla et al., 2014; Reimsbach, 2014; Hogan et al., 2017) and professional investors (Andersson and Hellman, 2007; Dilla et al., 2013). These prior studies manipulate the presentation of non-GAAP disclosure financial elements (presence, prominence and/or reconciliation format), rather than the accompanying non-financial information (purpose), such as that found in the Management Discussion and Analysis (MD&A) portion of corporate filings.

Research finds other forms of non-financial information are decision-useful for investors (Amir and Lev, 1996; Ittner and Larcker, 1998). Coram et al. (2009) find the disclosure of non-financial information, such as customer satisfaction ratings, affects sophisticated users' stock price estimates. These researchers report positive non-financial information leads users to assign a higher stock price valuation than does negative information.

The first hypothesis predicts investors will positively view non-GAAP compensation, therefore increasing investors' evaluation of corporate financial performance. It is expected these evaluations will similarly influence investors' quantitative financial judgments. Therefore, our second hypothesis is:

H2: Investors' quantitative financial judgments will be higher (lower) when non-GAAP earnings are (not) used to determine executive compensation.

However, financial and non-financial information may not be weighted equally in decision making. Coram et al. (2011) demonstrate the relative importance of financial information may be impacted by the non-financial information. In an experimental setting, they find the attention analysts pay to non-financial disclosures is affected by the accompanying financial information. To assess the strength of investors' attributions in H1 and H2, if any, we

introduce a scenario where managements' actions are traditionally seen as opportunistic by introducing financial information that polarises with the non-financial, non-GAAP disclosure.

Concerns about non-GAAP earnings misleading investors are well documented. The classic case is the use of non-GAAP earnings to *'recast a loss as if it were a profit'* (SEC, 2001). Companies that exclude income reducing items to recast a GAAP loss as a non-GAAP profit are called 'loss converters' (Leung and Veenman, 2018, p. 4). These authors conclude, from the loss converter subset of their data, that managements' exclusion of expenses is informative for investors and aids investor decision making with regards to assessing loss converters' future earnings performance. These findings contrast with prior research which suggests loss converters' non-GAAP disclosures are viewed sceptically by the market. Black et al. (2012) find, in a post-SOX sample, investors aggressively discount loss conversion companies, relative to other companies. Black and Christensen (2009) find loss converters 'were more likely than not to exclude income statement items that could be associated with opportunistic motives' (p. 323) to meet strategic targets. Bhattacharya et al. (2003) find that while analysts discount loss converters' non-GAAP earnings surprises, investors are less wary. Prior to Leung and Veenman (2018), the non-GAAP literature clearly presents loss conversion as indicative of opportunistic reporting behaviour. However, Leung and Veenman (2018) do not consider non-GAAP compensation. Isidro and Marques (2013) find, in an international sample, companies with directors' compensation linked to non-GAAP earnings are more likely to behave opportunistically to increase performance-based compensation. Specifically, non-GAAP compensation companies adjust for recurring expenditure more frequently, give greater prominence to non-GAAP measures, and are less likely to provide a GAAP to non-GAAP reconciliation. Curtis et al. (2021) find firms using non-GAAP earnings to determine executive compensation are more likely to meet minimum performance targets and pay higher performance-related bonuses. Their conclusion is CEOs opportunistically use the discretion

available in non-GAAP earnings. The findings from this prior non-GAAP and executive compensation research lead us to hypothesise the expected informative attributions in H1 and H2 will be reversed in loss converters. That is, a GAAP loss, in the presence of a non-GAAP profit, will lead to investors attributing managements' disclosure of non-GAAP compensation to opportunistic motivations. Therefore, our third and fourth hypotheses are:

H3: Investors' evaluations of loss converters' financial performance will be lower (higher) when non-GAAP earnings are (not) used to determine executive compensation.

H4: Investors' quantitative financial judgments of loss converters will be lower (higher) when non-GAAP earnings are (not) used to determine executive compensation.

The final two hypotheses utilise a mediation model to explore the relationship between non-GAAP compensation and investors' judgments more fully. The first two hypotheses predict investors will positively view non-GAAP compensation because they attribute the disclosure to managements' intent to inform investors. In other words, the relationship between non-GAAP compensation and investor judgments is indirect (i.e., mediated by managements' informative intention). Stated formally:

H5: Investors' perceptions of managements' intent to inform will mediate the relationship between investors' evaluations of corporate financial performance and managements' use of non-GAAP compensation.

H6: Investors' perceptions of managements' intent to inform will mediate the relationship between investors' quantitative financial judgments and managements' use of non-GAAP compensation.

EXPERIMENTAL METHOD

Participants

Participants are 122 individuals recruited from an online panel provider, Cint⁴. The panel registration process requires potential panellists (participants) to complete demographic and profiling information. This research targeted active equity investors and finance professionals (indicating active participation in stock trading or a job title as being concerned with audit, corporate finance, financial analysis/research/reporting, fund accounting or investment management). Approximately 75 percent (92/122) actively participate in stock trading (average of 8.1 years trading experience), while 48 percent (59/122) work in the finance sector (average tenure of 9.7 years).⁵ All participants are based in the U.S. and aged between 21 and 80 (average 43) years old, with females making up 38 percent of the sample.

Figure 1: Experimental design

Non-GAAP used to determine executive compensation?		
	<i>UseComp*</i>	
<i>GAAPProfit*</i>	Yes	No
GAAP Profit	Treatment 1 n = 38	Treatment 2 n = 30
GAAP Loss	Treatment 3 n = 28	Treatment 4 n = 26

* *GAAPProfit* and *UseComp* are the independent/manipulated variables

⁴ <https://www.cint.com/>

⁵ The results are inferentially the same if stock trading and work experience are included as covariates. However, because neither experience was significant, it is excluded from the analysis presented in the 'Results' section.

Attention checks

As we use an online panel provider, we employ several attention checks to ensure the data quality. Previous research suggests online participants can perform as diligently as traditional participants (Brandon et al., 2014; Farrell et al., 2017). Krische (2019) found online respondents with investment experience are more likely, and willing, to engage diligently in investment-related judgment activities.

Prior to beginning the experiment, the participants provide informed consent and perform a simple attention check as the first step in ensuring data quality. Initial screening targeted suitable participants (active equity investors and finance professionals). However, being suitable and being motivated to perform diligently are not synonymous. In total, 453 participants began the experiment, and we collected 122 usable responses.⁶ The length (average completion time of 27 minutes) and complexity of the experimental materials help explain a large number of incompletes (138 of 453) and the attention check fail rate (193 of 315).⁷ The usable response rate is not substantially different from previous studies (Hauser and Schwarz, 2016; Andon et al., 2018).

Design and manipulations

Participants evaluated the most recent financial information of Health Solutions Ltd, a hypothetical company based on a real S&P500 pharmaceutical company. We use a 2 x 2 between-subjects experimental design to test the hypotheses (Figure 1). Manipulations are

⁶ Our collected number of responses are in line with Jacob Cohen, "A Power Primer," *Psychological bulletin* 112, no. 1 (1992): 158., who suggests researchers targeting a medium to large effect size, using an alpha level of 0.05, should aim for 18-45 participants per treatment group. Four treatment groups, with an average of 30 per group, leads to a total sample size of approximately 120. The treatment group and attention check accuracy of completed responses are the only variables checked during the data collection stage.

⁷ Our manipulation failure rate is high compared to prior research, specifically those who use mTurk. We attribute this to our panel provider not providing a feature similar to mTurk where participation can be restricted based on individuals' past HIT approval rate. Meaning that they have shown to perform diligently in past tasks. While our results are inferentially the same if we include the investors who failed the manipulation checks in our experiments, the significance of the statistical tests decreases due to the introduction of noise to the data.

GAAP earnings (profit/loss) and managements' use of non-GAAP earnings (used/not used in determining executive compensation). These two manipulations are the study's independent measures, titled *GAAPProfit* and *UseComp*, respectively. Participants are randomly assigned to one of four treatment groups with no significant difference in demographics noted across groups.⁸

Participants are provided with a brief description of the hypothetical company and an extract from its hypothetical 10-K filing for the year ended 31 December 2017. The extract contained a written summary of the year-end results on a GAAP and non-GAAP basis, including EPS calculations, and a statement of how the company's management uses non-GAAP earnings. Three schedules then follow: GAAP to non-GAAP earnings reconciliation; Consolidated GAAP Statement of Income; and Consolidated Balance Sheet.

In line with archival findings, non-GAAP earnings exceeds GAAP earnings in each scenario (Bhattacharya et al., 2003; Brown et al., 2012; Choi and Young, 2015; Malone et al., 2016).⁹ Also similar to archival findings (Lougee and Marquardt, 2004), and previous non-GAAP experiments (Elliott, 2006; Andersson and Hellman, 2007; Hogan et al., 2017), the *GAAPProfit* manipulation contains a non-GAAP profit and a GAAP loss. Unlike Elliott (2006) and Frederickson and Miller (2004), but similar to Andersson and Hellman (2007), we utilise a material difference between non-GAAP and GAAP earnings.

Task and procedure

We begin the experiment by presenting the manipulated stimulus materials, described above, followed by a manipulation reinforcement. Participants are required to provide correct answers to the manipulation reinforcement questions before being able to continue. The

⁸ Demographics compared across treatments include the number of years stock trading experience, number of years work experience, average stock investment time horizon, and investment risk profile.

⁹ As our scenarios are comprised of situations where non-GAAP earnings are higher than GAAP earnings, we are unable to comment on what would be observed in the reverse situation.

manipulation reinforcement questions design minimises the possibility of creating a demand effect and have precedent in prior research (Peecher, 1996; Payne et al., 2010; Harding and Trotman, 2017).

The first set of questions concerned participants' judgments based on the stimulus materials, including rating of the realism and sufficiency of those materials, as well as an open response question where any comments deemed relevant could be provided. These *investor judgment* questions formed the dependent variable measures used to test the hypotheses. Participants can view the stimulus materials and *investor judgment* questions concurrently.

A second question set contained questions aimed at helping understand participants' decision-making process. Specifically, participants are asked which, and how, elements of the experimental materials influenced their responses in the first question set. These questions are included to test the findings of previous non-GAAP experimental studies, which attributed unintentional cognitive effects, rather than the perceived usefulness of non-GAAP earnings, as the mechanism influencing non-professional investors' investment decisions (Frederickson and Miller, 2004; Elliott, 2006). Participants could not change their answers from the first question set while answering these questions.

The manipulation check section contains three questions. One for each manipulation and a specific, multipart question to examine if the *UseComp* manipulation was effective. This specific manipulation check is used in the additional analysis section to provide further insight into the question of unintended cognitive effects (Highhouse, 2009).

Dependent variables

This research seeks to determine if (and how) *investors' judgments* are affected by certain financial statement disclosures. Because *investors' judgments* are not directly observable, they are measured via the two dimensions (or constructs) discussed in the

hypothesis development section. Figure 2 provides an overview of the dimensions of *investors' judgments* as well as the hypotheses and dependent variables utilised in the experiment.

Figure 2: Dependent variables and related hypotheses

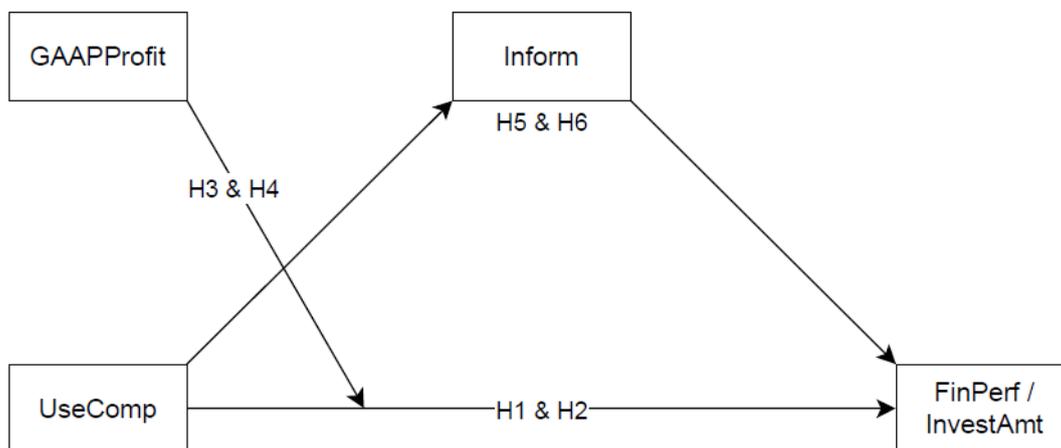
Concept	Investors' judgments		
Dimensions (constructs)	Financial performance		Quantitative investment decisions
Hypotheses	H1, H3 & H5 (via <i>Inform</i>)		H2, H4 & H6 (via <i>Inform</i>)
Empirical proxies	Earnings performance	Earnings potential	Investment amount
Dependent variables	<i>EarnPerf</i>	<i>EarnPot</i>	<i>InvestAmt</i>

The *financial performance* dimension of *investors' judgments* is measured using a combination of two empirical proxies (dependent variables): *earnings performance (EarnPerf)* and *earnings potential (EarnPot)*. Participants' evaluation of the *earnings performance (EarnPerf)* and *earnings potential (EarnPot)* of Health Solutions is measured on an 11-point scale (0 = very weak to 10 = very strong). These two variables have precedent in previous non-GAAP experimental research (Elliott, 2006; Dilla et al., 2013; Reimsbach, 2014). A principal component analysis (PCA) combines both these proxies into a single financial performance component, *FinPerf*.

The *quantitative investment decision* dimension of *investors' judgments* is measured using the empirical proxy: *investment amount (InvestAmt)*. Participants are told to assume they already own a diversified stock portfolio and have an additional \$10,000 to invest. An 11-point scale (0 = nothing at all to \$10,000 = the entire amount) with increments of \$1,000 recorded participants' responses to the question, 'How much of the \$10,000 would you invest in Health Solutions?'. The resulting dependent variable is titled *InvestAmt*. Previous non-GAAP experimental research employs the same variable to quantitatively capture investors' investment decisions (Elliott, 2006; Dilla et al., 2013; Hogan et al., 2017).

Hypotheses five and six test whether the perception of managements' intention to inform investors is a mediator with respect to non-GAAP compensation and investors' judgments (*financial performance* and *quantitative investment decisions*). Participants are asked, 'Why do you believe Health Solutions' management discloses non-GAAP earnings measures: To inform investors?'. Responses are collected using a seven-point scale with 'Strongly disagree' (-3) and 'Strongly agree' (3) at opposite ends of the scale with the mid-point being 'Neither agree nor disagree' (0). The resulting mediating variable is titled *Inform*.¹⁰

Figure 3: Theoretical framework of study



Previous non-GAAP experimental research finds non-GAAP measures can influence investor (both professional and non-professional) decision making (Frederickson and Miller, 2004; Elliott, 2006; Andersson and Hellman, 2007; Dilla et al., 2013; Hogan et al., 2017). Prior research concludes unintentional cognitive effects, rather than perceived information content, are responsible for non-professional investors' judgments (Frederickson and Miller, 2004; Elliott, 2006). That is, non-professional investors do not intentionally rely on non-GAAP

¹⁰ We also collect data on whether they perceive the disclosure to be misleading, however, our results (untabulated) show that there is no evidence to suggest that they find them misleading, or that this attribution has any effect on decision-making.

information, but rather their judgments are influenced by the presence and prominence of non-GAAP measures.

The current experiment tests if the prior unintentional cognitive effects findings are applicable in the present regulatory environment and with participants who do not fit into the dichotomous professional (e.g., analysts) or non-professional (e.g., M.B.A. students) investor groups. In addition to the dependent variables discussed above, additional analysis is conducted by examining participant responses to supplementary questions. Participants are asked the following questions as part of the *decision-making question set*: ‘In determining your \$10,000 investment decision earlier, which of the following did you find the most useful?’ The response scales, dependent variables and analysis methods are discussed as additional analyses in the Results section below.

RESULTS

The participants rated both the realism ($M=7.0$, $SD=2.2$) and sufficiency ($M=7.1$, $SD=2.2$) of the materials highly.¹¹ A multivariate analysis of variance (MANOVA) revealed no significant difference between the treatment groups (results untabulated). These results support the suitability of the materials for the task and enhance the potential generalisability of the findings. Table 1 presents the mean and standard deviations for each of the empirical proxies used to test the hypotheses. The descriptive statistics are reported by treatment group.

¹¹ Based on an 11-point scale (0 = not at all realistic/sufficient to 10 = very realistic/sufficient).

Table 1: Descriptive statistics of participants' judgments

Panel A: Descriptive statistics of financial performance judgments – Mean (SD)

GAAP earnings	Non-GAAP compensation	n	<i>EarnPerf</i>	<i>EarnPot</i>	<i>FinPerf</i> ¹² (component)
Profit	Yes	38	7.8 (1.9)	7.9 (1.5)	0.5 (0.9)
	No	30	7.1 (1.4)	7.1 (1.5)	0.1 (0.8)
Loss	Yes	28	6.4 (2.1)	6.6 (1.9)	-0.2 (1.1)
	No	26	5.7 (2.0)	6.0 (1.9)	-0.6 (1.0)
Combined		122	6.8 (2.0)	7.0 (1.8)	0.0 (1.0)

Panel B: Descriptive statistics of *FinPerf*– Mean (SD)

<i>UseComp</i>			
<i>GAAPProfit</i>	Yes	No	Combined
GAAP Profit	0.5 (0.9)	0.1 (0.8)	0.3 (0.8)
GAAP Loss	-0.2 (1.1)	-0.6 (1.0)	-0.4 (1.0)
Combined	0.2 (1.0)	-0.2 (0.9)	0.0 (1.0)

Panel C: Descriptive statistics of *InvestAmt* – Mean (SD)

<i>UseComp</i>			
<i>GAAPProfit</i>	Yes	No	Combined
GAAP Profit	6,553 (2,975)	4,600 (2,884)	5,691 (3,073)
GAAP Loss	4,643 (2,857)	3,231 (2,997)	3,963 (2,984)
Combined	5,742 (3,055)	3,964 (2,991)	4,926 (3,142)

Panel D: Descriptive statistics of *Inform* - Mean (SD)

<i>UseComp</i>			
<i>GAAPProfit</i>	Yes	No	Combined
GAAP Profit	1.7 (1.3)	1.3 (1.2)	1.5 (1.3)
GAAP Loss	1.9 (0.8)	1.1 (1.4)	1.5 (1.2)
Combined	1.8 (1.1)	1.2 (1.3)	1.5 (1.2)

Test of hypotheses 1 and 2

Participants' evaluations of corporate financial performance are captured using a single component created from two dependent variables, *earnings performance* and *earnings*

¹² The two dependent variables, *earnings performance* and *earnings potential* are combined into a single component using principal component analysis (total variance explained = 86%). The new component is named *Financial Performance (FinPerf)*.

potential.¹³ A one-way between groups analysis of variance (ANOVA) is conducted to test H1. The independent variable is *UseComp*. Preliminary assumption testing is conducted with no significant violations noted (results not reported here). Panel A of Table 2 summarises the ANOVA results. There is a statistically significant main effect for *UseComp* ($F=(1,120)=5.62$, $p=0.017$; $\eta^2=0.05$).

Table 2: Summary of ANOVA results

Source of Variation	SS	df	MS	F	p-value	η^2
Panel A: One-way ANOVA model test of H1 - <i>FinPerf</i>						
<i>UseComp</i>	5.62	1	5.62	5.85	0.017	0.05
Error	115.38	120	0.84			
Panel B: One-way ANOVA model test of H2 – <i>InvestAmt</i>						
<i>UseComp</i>	95786282	1	95786282	10.46	0.002	0.09
Error	1098549784	120	9154581			
Panel C: Two-way ANOVA model test of H3 - <i>FinPerf</i>						
<i>UseComp</i>	4.79	1	4.79	5.68	0.019	0.04
<i>GAAPProfit</i>	15.71	1	15.71	18.63	0.000	0.13
<i>UseComp</i> * <i>GAAPProfit</i>	0.00	1	0.00	0.01	0.943	0.00
Error	99.54	118	0.84			
Panel D: Two-way ANOVA model test of H4 – <i>InvestAmt</i>						
<i>UseComp</i>	84598107	1	84598107	9.85	0.002	0.07
<i>GAAPProfit</i>	80342831	1	80342831	9.35	0.003	0.07
<i>UseComp</i> * <i>GAAPProfit</i>	2183355	1	2183355	0.25	0.615	0.00
Error	1013638692	118	8590158			

Within the levels of *UseComp*, an examination of the component (*FinPerf*), used to test the directional H1, reveals the means for the treatment groups (1 and 3) where executive compensation is determined using non-GAAP earnings ($M=0.2$, $SD=1.0$) is significantly higher

¹³ The two dependent variables, *earnings performance* and *earnings potential*, are combined into a single component using principal component analysis (total variance explained = 86%). The new component is named *FinPerf*.

than the means for the groups (2 and 4) without a link to executive compensation ($M=-0.2$, $SD=0.9$), as per Panel B of Table 1. That is, participants attribute a significantly higher evaluation of corporate financial performance when management uses non-GAAP earnings measures in determining executive compensation. H1 predicts the use of non-GAAP earnings to determine executive remuneration will increase investors' evaluations of corporate financial performance. Therefore, H1 is supported.

We capture participants' quantitative financial judgments using the dependant variable *InvestAmt*. A one-way between-groups ANOVA is conducted to test H2. The independent variable is *UseComp*. Preliminary assumption testing is conducted with no significant violations noted (results not reported here). Panel B of Table 2 summarises the ANOVA results. There is a statistically significant main effect for *UseComp* ($F=(1,120)=10.46$, $p=0.002$; $\eta^2=0.09$).

Within the levels of *UseComp*, an examination of *InvestAmt*, used to test the directional H2, reveals the means for the treatment groups (1 and 3) where executive compensation is determined using non-GAAP earnings ($M=5,742$, $SD=3,055$) is significantly higher than the means for the groups (2 and 4) without a link to executive compensation ($M=3,964$, $SD=2,991$), as reported in Panel C of Table 1. That is, participants are prepared to invest significantly more when management uses non-GAAP earnings measures in determining executive compensation. H2 predicts the use of non-GAAP earnings to determine executive remuneration will increase investors' quantitative financial judgment. Therefore, H2 is supported.

Test of hypotheses 3 and 4

H3 posits that investors' evaluations of loss converters' corporate financial performance will be the reverse of the relationship found in H1. That is, a GAAP loss, in the presence of a non-GAAP profit, will lead participants to attribute non-GAAP compensation to managements'

opportunistic motivations. To test H3, we examine the two-way ANOVA interaction effect between the independent variables *GAAPProfit* and *UseComp* with participants' evaluations of financial performance captured using the dependent variable component *FinPerf*. We find the interaction is not statistically significant ($F=(1,118)=0.01, p=n.s.; \eta^2=0.00$). Panel C of Table 2 summarises the ANOVA results. The lack of interaction shows participants' relative evaluations of financial performance are unchanged when analysing loss converters. A means comparison of the component *FinPerf* (Panel B of Table 1) shows the lack of interaction as the means for the non-GAAP compensation treatment groups (1 and 3) are both higher than the corresponding treatment groups (2 and 4) where non-GAAP earnings are not used to determine compensation. Participants provided a higher evaluation of financial performance regardless of the analysed company being a loss converter. Therefore, H3 is not supported.

Although there no interaction effect, there is, unsurprisingly, a statistically significant main effect for *GAAPProfit* ($F=(1,118)=18.63, p<0.001; \eta^2=0.13$ (Panel C of Table 2). A means comparison of the component *FinPerf* shows the means for the GAAP profit treatment groups (1 and 2) ($M=0.3, SD=0.8$) are significantly higher than the means for the GAAP loss treatment groups (3 and 4) ($M=-0.4, SD=1.0$) (Panel B of Table 1). That is, investors attribute a higher evaluation of corporate financial performance in the presence of a GAAP profit when compared to a GAAP loss. A GAAP profit or loss has a larger effect ($\eta^2=0.13$) on investors' evaluations of financial performance than does the use of compensation ($\eta^2=0.04$), however, both are important factors in investors' decision making.

H4 posits that investors' quantitative financial judgments of loss converters' will be the reverse of the relationship found in H2. That is, a GAAP loss, in the presence of a non-GAAP profit, will lead participants to attribute non-GAAP compensation to managements' opportunistic motivations. To test H4, we examine the two-way ANOVA interaction effect between the independent variables *GAAPProfit* and *UseComp* with participants' quantitative

financial judgements captured using the dependent variable *InvestAmt*. We find the interaction is not statistically significant ($F=(1,118)=0.25$, $p=n.s.$; $\eta^2=0.00$). Panel D of Table 2 summarises the ANOVA results. The lack of interaction shows participants' relative quantitative financial judgments are unchanged when analysing loss converters. Means comparison of the component *InvestAmt* (Panel C of Table 1) shows the lack of interaction as the means for the non-GAAP compensation treatment groups (1 and 3) are both higher than the corresponding treatment groups (2 and 4) where non-GAAP earnings are not used to determine compensation. Participants provided higher quantitative financial judgments regardless of the analysed company being a loss converter. Therefore, H4 is not supported.

Again, and unsurprisingly, a statistically significant main effect is found for *GAAPProfit* ($F=(1,118)=9.35$, $p=0.003$; $\eta^2=0.07$). Means comparison of *InvestAmt*, across the levels of *GAAPProfit*, show the means for the GAAP profit treatment groups (1 and 2) ($M=5,691$, $SD=3,073$) are significantly higher than the means for the GAAP loss treatment groups (3 and 4) ($M=3,963$, $SD=2,984$) (Panel C of Table 1). That is, investors are prepared to invest more capital in the presence of a GAAP profit when compared to a GAAP loss. However, what we did find surprising is the same explanatory power (effect size) for both *GAAPProfit* and *UseComp* ($\eta^2=0.07$). This finding suggests, in our sample, users consider non-GAAP compensation as important as GAAP profitability when making their quantitative financial judgements.

Test of hypotheses 5 and 6

Mediation analysis is used to test hypotheses 5 and 6. A mediating variable helps better understand the mechanism through which the independent variable influences the dependent variable (Hayes, 2018, p. 7). In our study, H1 and H2 establish a significant relationship between non-GAAP compensation (independent variable *UseComp*) and both participants'

evaluations of financial performance (H1: dependent variable *FinPerf*) and their quantitative investment decisions (H2: dependent variable *InvestAmt*). For H5 and H6 the mediating variable is investors' perceptions of managements' intent to provide informative disclosures (*Inform*). This study follows the Hayes (2018) statistical approach to mediation testing. Specifically, we test H5 and H6 using the SPSS PROCESS macro to obtain 95 percent bias-corrected confidence intervals bootstrapped with 5,000 resamples. For mediation to exist, non-GAAP compensation (*UseComp*) must first affect investor perceptions of managements' intent to inform (*Inform*) (a). Second, *Inform* must significantly affect *FinPerf* (H5) or *InvestAmt* (H6) (b). Third, for perfect mediation to exist, the indirect effect of *UseComp* on *FinPerf* or *InvestAmt* must not be significant (c).

The results in Table 3 and Figure 4 provide support for both H5 and H6. The significant positive path coefficient for *UseComp* on *Inform* ($a = 0.57$) indicates the participants attribute the use of non-GAAP earnings to determine executive compensation to managements' intention to provide informative information to investors. The significant positive path coefficient for *Inform* on *FinPerf* ($b_1 = 0.34$) and *InvestAmt* ($b_2 = 857$) indicates participants' informative attribution of managements' intentions positively affects their evaluation of the company's financial performance (H5: *FinPerf*) and their decision to invest into the company (H6: *InvestAmt*). Finally, the indirect effect of *UseComp* on *FinPerf* (LLCI = 0.04 and ULCI = 0.40) and *InvestAmt* (LLCI = 102 and ULCI = 1,005) provide evidence of significant mediation with 95 percent bias-corrected confidence intervals that do not include zero.

The non-significant path coefficient for *UseComp* on *FinPerf* ($c'_1 = 0.24$) indicates perfect mediation. That is, participants' informative attribution of managements' intentions fully explains the relationship between non-GAAP compensation and their evaluation of financial performance. The significant path coefficient for *UseComp* on *InvestAmt* ($c'_2 = 1,286$) indicates a lack of perfect mediation. That is, participants' informative attribution of

managements' intentions does not fully explain the relationship between non-GAAP compensation and the amount they are likely to invest, there is another contributing factor(s) that helps explain the relationship.

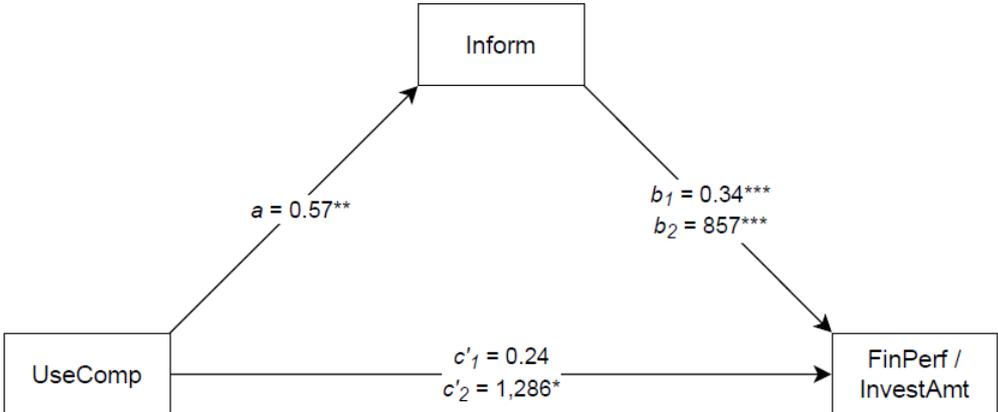
Table 3: Mediation analysis

Panel A: Path estimates and coefficients for mediation model test of H5 and H6								
Path	Coefficient		t	p-value	LLCI ^a	ULCI ^a	R ²	
UseComp → Inform	0.57	a	2.63	0.010	0.14	1.00	0.06	
Inform → FinPerf	0.34	b ₁	4.99	0.000	0.21	0.48	0.21	
Inform → InvestAmt	857	b ₂	3.93	0.000	426	1,288	0.19	
UseComp → FinPerf	0.24	c' ₁	1.41	0.162	-0.10	0.57	0.21	
UseComp → InvestAmt	1,286	c' ₂	2.41	0.018	229	2,344	0.19	

Panel B: Indirect effects and confidence intervals				
Indirect effect	Effect	LLCI ^a	ULCI ^a	
UseComp → FinPerf	0.20*	0.04	0.40	
UseComp → InvestAmt	492*	102	1,005	

^a Represents 95 percent bias-corrected confidence intervals obtained from a bootstrapping method with 5,000 bootstrapped resamples. * Denotes p-value of 0.05 or less

Figure 4: Observed mediation model for hypotheses 5 and 6



p-value of < 0.05 (*), < 0.01 (**), and < 0.001 (***)

Taken together, the results indicate the use of non-GAAP earnings to determine executive compensation increases investor evaluations of financial performance, and the amount investors are likely to invest indirectly through an informative attribution of management's disclosure intention.

Additional analyses

Previous non-GAAP experimental research attributed unintentional cognitive effects as the mechanism influencing investor judgments (Frederickson and Miller, 2004; Elliott, 2006). This current research seeks to determine if, in the post-SOX reporting environment, participants intentionally rely on non-GAAP disclosures in their judgments. A specific manipulation check assesses the salience of the *UseComp* manipulation. Participants are asked, 'How did Health Solutions' use of non-GAAP financial measures in calculating executive performance-based compensation affect your previous responses?'. Participants rated the influence non-GAAP compensation had on their previous responses, '*current earnings performance*', '*future earnings potential*' and '*decision to invest \$10,000*' on an 11-point scale (0 = not at all affected to 10 = very much affected). Using principal component analysis, the three responses are combined into a single component for analysis (*Decisions*). Panel A of Table 4 presents the descriptive statistics for the specific manipulation check as well as the resulting component. The results of a two-way ANOVA, presented in Panel B of Table 4, are consistent with the informative view of non-GAAP measures.

A two-way ANOVA investigates if participants intentionally relied on how Health Solutions used non-GAAP earnings when making their decisions. One dependent variable is analysed: *Decisions*. The independent variables are *GAAPProfit* and *UseComp*. Using an adjusted alpha level of 0.025 due to a Levene's test violation, the interaction effect between *GAAPProfit* and *UseComp* is not statistically significant ($F=(1,118)=0.07$, $p=n.s.$; $\eta^2=0.00$).

However, a statistically significant main effect is found for *UseComp* ($F=(1,118)=11.69$, $p=0.001$; $\eta^2=0.09$) but not for *GAAPProfit* ($F=(1,118)=0.01$, $p=n.s.$; $\eta^2=0.00$).

Table 4: Specific manipulation check analysis

Panel A: Descriptive statistics for responses to specific manipulation check questions – Mean (SD)						
GAAP earnings	Non-GAAP determines compensation	n	Current earnings performance	Future earnings potential	Decision to invest \$10k	Decisions (component)
Profit	Yes	38	7.5 (2.2)	7.1 (2.1)	7.3 (2.4)	0.3 (0.8)
	No	30	5.8 (3.3)	6.0 (3.2)	5.7 (3.4)	-0.3 (1.2)
Loss	Yes	28	7.5 (2.2)	7.5 (2.2)	7.2 (2.3)	0.3 (0.8)
	No	26	5.6 (3.1)	2.6 (3.0)	6.1 (3.4)	-0.4 (1.1)
Combined		122	6.7 (2.8)	6.6 (2.7)	6.7 (2.9)	0.0 (1.0)

Panel B: Two-way ANOVA model test of <i>Decisions</i>*						
Source of Variation	SS	df	MS	F	p-value	η^2
<i>UseComp</i>	10.91	1	10.91	11.69	0.001	0.09
<i>GAAPProfit</i>	0.00	1	0.00	0.01	0.978	0.00
<i>UseComp</i> * <i>GAAPProfit</i>	0.07	1	0.07	0.07	0.792	0.00
Error	110.08	118	0.93			

* The three dependent variables, *current earnings performance*, *future earnings potential* and *decision to invest \$10,000*, are combined into a single component using principal component analysis (total variance explained = 83%). The new component is named *Decisions*.

An inspection of the mean scores for the component *Decisions* reveals the treatment groups (1 and 3) where executive compensation is determined using non-GAAP earnings ($M=0.3$, $SD=0.8$) is significantly higher than the groups (2 and 4) without a link to executive compensation ($M=-0.3$, $SD=1.2$). That is, investors intentionally rely more on non-GAAP earnings when they are used to determine executive compensation as opposed to when they are not. This finding further supports the informative nature hypothesis of non-GAAP measures. These results corroborate the main findings and the medium to large effect size ($\eta^2=0.09$) shows

there is a meaningful and strong relationship between non-GAAP earnings and investor decisions.

Together, this evidence suggests investors are aware of and cognitively use non-GAAP measures in their decision making. The contrast to prior experimental studies (Frederickson and Miller, 2004; Elliott, 2006) is potentially explained by the passage of time since conducting the research. The last decade has seen an increase in non-GAAP exposure and scrutiny (SEC, 2010; Henry et al., 2017; Cohn, 2018) and thus may go some way in explaining investors' awareness and increased reliance on non-GAAP measures in their decision making. Another explanation could be a difference in participants. Prior research indicates unintentional cognitive effects influenced M.B.A. students' (as proxies for non-professionals) judgments (Frederickson and Miller, 2004; Elliott, 2006). The participants in this study are neither professional investors nor M.B.A. students, but rather non-professional investors and finance professionals with stock trading and/or investment related experience. Our results support the Elliott et al. (2007) findings of M.B.A. students' lack of suitability for investment related decision-making experiments.

DISCUSSION AND CONCLUSION

This study examines how the use of non-GAAP earnings to determine executive compensation affects investors' judgments. Using an experiment, this paper finds that when non-GAAP earnings are used in determining executive compensation, participants assign a more favourable evaluation of financial performance and are prepared to invest significantly more capital. Unsurprisingly, we also find participants more favourably evaluate financial performance and are prepared to invest more capital when a company discloses a GAAP profit.

Consistent with attribution theory, we use a mediation model and find evidence that investors attribute non-GAAP compensation to managements' desire to inform the market, and

this, in turn, is what influences their evaluation of financial performance and investment decisions. Investors do not, in our setting, view non-GAAP compensation as a way for managements to opportunistically increase their remuneration. The lack of observed interaction between the manipulations in our results demonstrates investors do not change their attributions in a purposefully opportunistic setting. The *GAAPProfit* manipulation provides a robust test of attribution theory. That is, even when management reports a GAAP loss, but calculates their remuneration using a disclosed non-GAAP profit, investors attribute non-GAAP compensation to managements' desire to inform. Although not in an empirical setting, the examination of loss converters begins to address call of Aubert and Grudnitski (2014) to extend research of non-GAAP earnings to situations where regulatory concern is heightened.

Taken together, the results suggest companies using non-GAAP compensation are viewed more favourably by investors. Investors find non-GAAP compensation informative, rather than opportunistic. In addition, these findings persist in a purposely opportunistic loss conversion scenario. Mediation analyses provide further support for the informative disclosure hypothesis for managements' motivations by demonstrating participants intentionally relied on non-GAAP earnings when making their decisions, and that their perception of informativeness, in turn, influenced their evaluation of financial performance and investment decisions.

~~Prior experimental literature uses either participants' estimated earnings per share or the amount they are willing to invest to capture investors' quantitative judgments. Our study shows both measures result in inferentially the same conclusions. The implication is that future researchers can choose the dependent measure most appropriate to their experimental design confident the choice is not a compromise.~~

This study is subject to several limitations. First, the experimental materials provide participants with only a subset of the information usually available to them in the real world. Second, the complexity and length of the stimulus materials limit the suitability of some

participants. The experimental overview sent to participants details the expectations and estimated completion time, participants who signed up may not have appreciated the difficulty of the task, hence the high manipulation check failure rate. Future work should better isolate hypothesis testing. Breaking the research questions into smaller, distinct experiments is an example approach. Third, the only use of non-GAAP earnings this experiment examines is in determining executive compensation. Different uses of non-GAAP earnings may elicit different investor judgments. Future work should examine other uses of non-GAAP measures on investor judgments. Furthermore, while our experiment implicitly assumes that management decides on the internal use of non-GAAP earnings, this can also be mandated by powerful external parties such as institutional investors. However, our experiment is not able to comment on this specific type of situation. Fourth, as our scenarios are comprised of situations where non-GAAP earnings are higher than GAAP earnings, we are unable to comment on what would be observed in the reverse situation. Finally, this experiment employs online participants. Although online participants can be profiled and screened, there is no guarantee they possess the requisite skills to undertake a task as demanding as the one presented in this paper. Similarly, previous work in this area predominately relies on either online participants or convenience samples (M.B.A. and undergraduate students). An objective knowledge test could be used to better screen participants and ensure they possess task-suitable skills and knowledge.

Although not the primary focus, this study contributes to the broader decision-making literature. Prior research suggests a subset of investors rely on non-GAAP disclosures in their decision making but do so unknowingly (unintentional cognitive effects) (Frederickson and Miller, 2004; Elliott, 2006). This paper finds investors knowingly use non-GAAP measures when making investment evaluations and decisions. Public scrutiny and regulation have led to an increase in acceptance and understanding of non-GAAP measures as well as an improvement

in disclosure quality (Bond et al., 2017). As a result, investors seem more comfortable incorporating non-GAAP measures into their decision-making processes.

Despite a different regulatory jurisdiction, this study also contributes to the recent work by the IASB in addressing the growing use of non-GAAP measures internationally (Kabureck, 2017). The recent IASB exposure draft on the general presentation and disclosures highlights the importance of MPMs (IASB, 2019). The exposure draft recommends that entities provide footnote disclosure on why management's "non-GAAP" MPMs provide useful information about an entity's financial performance including how it is computed and how it relates to the GAAP reported numbers. The proposed recommendations are in line with our findings, that non-GAAP measures have the ability to provide informative information that investors find decision-useful, and while there may be potential for opportunistic behaviour that this can be curtailed by appropriate mandated disclosures. However, our results suggest that investors also find disclosures on the internal use of these measures to be useful, something that is currently not being considered by the IASB. Consequently, the findings of this research can help inform future standards as to what investors consider useful MPM and non-GAAP disclosures.

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